

=====

Sequence Listing was accepted.

If you need help call the Patent Electronic Business Center at (866)
217-9197 (toll free).

Reviewer: markspencer

Timestamp: [year=2008; month=7; day=28; hr=13; min=50; sec=5; ms=426;]

=====

Application No: 10718986 Version No: 2.0

Input Set:

Output Set:

Started: 2008-07-25 21:55:54.597
Finished: 2008-07-25 21:55:55.587
Elapsed: 0 hr(s) 0 min(s) 0 sec(s) 990 ms
Total Warnings: 1
Total Errors: 0
No. of SeqIDs Defined: 12
Actual SeqID Count: 12

| Error code | Error Description |
|------------|---|
| W 213 | Artificial or Unknown found in <213> in SEQ ID (10) |

SEQUENCE LISTING

<110> Yu, Mang
Fang, Fang

<120> Broad Spectrum Anti-Viral Therapeutics
And Prophylaxis

<130> 21865-002001/6502

<140> 10718986
<141> 2003-11-21

<150> US 60/428,535
<151> 2002-11-12

<150> US 60/464,217
<151> 2003-04-19

<160> 12

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 58
<212> PRT
<213> Bos taurus

<400> 1
Arg Pro Asp Phe Cys Leu Glu Pro Pro Tyr Thr Gly Pro Cys Lys Ala
1 5 10 15
Arg Ile Ile Arg Tyr Phe Tyr Asn Ala Lys Ala Gly Leu Cys Gln Thr
20 25 30
Phe Val Tyr Gly Gly Cys Arg Ala Lys Arg Asn Asn Phe Lys Ser Ala
35 40 45
Glu Asp Cys Met Arg Thr Cys Gly Gly Ala
50 55

<210> 2
<211> 24
<212> PRT
<213> Homo sapiens

<400> 2
Asn Gly Arg Arg Ile Cys Leu Asp Leu Gln Ala Pro Leu Tyr Lys Lys
1 5 10 15
Ile Ile Lys Lys Leu Leu Glu Ser
20

<210> 3
<211> 27
<212> PRT
<213> Homo sapiens

<400> 3
Gly Arg Glu Leu Cys Leu Asp Pro Lys Glu Asn Trp Val Gln Arg Val
1 5 10 15
Val Glu Lys Phe Leu Lys Arg Ala Glu Asn Ser
20 25

<210> 4
<211> 34
<212> PRT
<213> Homo sapiens

<400> 4
Gln Ile His Phe Phe Phe Ala Lys Leu Asn Cys Arg Leu Tyr Arg Lys
1 5 10 15
Ala Asn Lys Ser Ser Lys Leu Val Ser Ala Asn Arg Leu Phe Gly Asp
20 25 30
Lys Ser

<210> 5
<211> 34
<212> PRT
<213> Homo sapiens

<400> 5
Glu Leu Arg Val Arg Leu Ala Ser His Leu Arg Lys Leu Arg Lys Arg
1 5 10 15
Leu Leu Arg Asp Ala Asp Asp Leu Gln Lys Arg Leu Ala Val Tyr Gln
20 25 30
Ala Gly

<210> 6
<211> 12
<212> PRT
<213> Homo sapiens

<400> 6
Arg Arg Leu Arg Arg Met Glu Ser Glu Ser Glu Ser
1 5 10

<210> 7
<211> 21
<212> PRT
<213> Homo sapiens

<400> 7
Lys Arg Lys Lys Lys Gly Gly Lys Asn Gly Lys Asn Arg Arg Asn Arg
1 5 10 15
Lys Lys Lys Asn Pro
20

<210> 8
<211> 379
<212> PRT
<213> Homo sapiens

<400> 8
Met Ala Ser Leu Pro Val Leu Gln Lys Glu Ser Val Phe Gln Ser Gly
1 5 10 15
Ala His Ala Tyr Arg Ile Pro Ala Leu Leu Tyr Leu Pro Gly Gln Gln
20 25 30
Ser Leu Leu Ala Phe Ala Glu Gln Arg Ala Ser Lys Lys Asp Glu His
35 40 45
Ala Glu Leu Ile Val Leu Arg Arg Gly Asp Tyr Asp Ala Pro Thr His
50 55 60
Gln Val Gln Trp Gln Ala Gln Glu Val Val Ala Gln Ala Arg Leu Asp
65 70 75 80
Gly His Arg Ser Met Asn Pro Cys Pro Leu Tyr Asp Ala Gln Thr Gly
85 90 95
Thr Leu Phe Leu Phe Phe Ile Ala Ile Pro Gly Gln Val Thr Glu Gln
100 105 110
Gln Gln Leu Gln Thr Arg Ala Asn Val Thr Arg Leu Cys Gln Val Thr
115 120 125
Ser Thr Asp His Gly Arg Thr Trp Ser Ser Pro Arg Asp Leu Thr Asp
130 135 140
Ala Ala Ile Gly Pro Ala Tyr Arg Glu Trp Ser Thr Phe Ala Val Gly
145 150 155 160
Pro Gly His Cys Leu Gln Leu Asn Asp Arg Ala Arg Ser Leu Val Val
165 170 175
Pro Ala Tyr Ala Tyr Arg Lys Leu His Pro Ile Gln Arg Pro Ile Pro
180 185 190
Ser Ala Phe Cys Phe Leu Ser His Asp His Gly Arg Thr Trp Ala Arg
195 200 205
Gly His Phe Val Ala Gln Asp Thr Leu Glu Cys Gln Val Ala Glu Val
210 215 220
Glu Thr Gly Glu Gln Arg Val Val Thr Leu Asn Ala Arg Ser His Leu
225 230 235 240
Arg Ala Arg Val Gln Ala Gln Ser Thr Asn Asp Gly Leu Asp Phe Gln
245 250 255
Glu Ser Gln Leu Val Lys Lys Leu Val Glu Pro Pro Pro Gln Gly Cys
260 265 270
Gln Gly Ser Val Ile Ser Phe Pro Ser Pro Arg Ser Gly Pro Gly Ser
275 280 285
Pro Gln Trp Leu Leu Tyr Thr His Pro Thr His Ser Trp Gln Arg Ala
290 295 300
Asp Leu Gly Ala Tyr Leu Asn Pro Arg Pro Pro Ala Pro Glu Ala Trp
305 310 315 320
Ser Glu Pro Val Leu Leu Ala Lys Gly Ser Cys Ala Tyr Ser Asp Leu
325 330 335
Gln Ser Met Gly Thr Gly Pro Asp Gly Ser Pro Leu Phe Gly Cys Leu
340 345 350
Tyr Glu Ala Asn Asp Tyr Glu Glu Ile Val Phe Leu Met Phe Thr Leu
355 360 365
Lys Gln Ala Phe Pro Ala Glu Tyr Leu Pro Gln
370 375

<210> 9
<211> 424
<212> PRT
<213> Homo sapiens

<400> 9
Leu Ala Gly Gly Ser Val Arg Trp Gly Ala Leu His Val Leu Gly Thr
1 5 10 15
Ala Ala Leu Ala Glu His Arg Ser Met Asn Pro Cys Pro Val His Asp
20 25 30
Ala Gly Thr Gly Thr Val Phe Leu Phe Phe Ile Ala Val Leu Gly His
35 40 45
Thr Pro Glu Ala Val Gln Ile Ala Thr Gly Arg Asn Ala Ala Arg Leu
50 55 60
Cys Cys Val Ala Ser Arg Asp Ala Gly Leu Ser Trp Gly Ser Ala Arg
65 70 75 80
Asp Leu Thr Glu Glu Ala Ile Gly Gly Ala Val Gln Asp Trp Ala Thr
85 90 95
Phe Ala Val Gly Pro Gly His Gly Val Gln Leu Pro Ser Gly Arg Leu
100 105 110
Leu Val Pro Ala Tyr Thr Tyr Arg Val Asp Arg Leu Glu Cys Phe Gly
115 120 125
Lys Ile Cys Arg Thr Ser Pro His Ser Phe Ala Phe Tyr Ser Asp Asp
130 135 140
His Gly Arg Thr Trp Arg Cys Gly Gly Leu Val Pro Asn Leu Arg Ser
145 150 155 160
Gly Glu Cys Gln Leu Ala Ala Val Asp Gly Gly Gln Ala Gly Ser Phe
165 170 175
Leu Tyr Cys Asn Ala Arg Ser Pro Leu Gly Ser Arg Val Gln Ala Leu
180 185 190
Ser Thr Asp Glu Gly Thr Ser Phe Leu Pro Ala Glu Arg Val Ala Ser
195 200 205
Leu Pro Glu Thr Ala Trp Gly Cys Gln Gly Ser Ile Val Gly Phe Pro
210 215 220
Ala Pro Ala Pro Asn Arg Pro Arg Asp Asp Ser Trp Ser Val Gly Pro
225 230 235 240
Arg Ser Pro Leu Gln Pro Pro Leu Leu Gly Pro Gly Val His Glu Pro
245 250 255
Pro Glu Glu Ala Ala Val Asp Pro Arg Gly Gly Gln Val Pro Gly Gly
260 265 270
Pro Phe Ser Arg Leu Gln Pro Arg Gly Asp Gly Pro Arg Gln Pro Gly
275 280 285
Pro Arg Pro Gly Val Ser Gly Asp Val Gly Ser Trp Thr Leu Ala Leu
290 295 300
Pro Met Pro Phe Ala Ala Pro Pro Gln Ser Pro Thr Trp Leu Leu Tyr
305 310 315 320
Ser His Pro Val Gly Arg Arg Ala Arg Leu His Met Gly Ile Arg Leu
325 330 335
Ser Gln Ser Pro Leu Asp Pro Arg Ser Trp Thr Glu Pro Trp Val Ile
340 345 350
Tyr Glu Gly Pro Ser Gly Tyr Ser Asp Leu Ala Ser Ile Gly Pro Ala
355 360 365
Pro Glu Gly Gly Leu Val Phe Ala Cys Leu Tyr Glu Ser Gly Ala Arg
370 375 380
Thr Ser Tyr Asp Glu Ile Ser Phe Cys Thr Phe Ser Leu Arg Glu Val
385 390 395 400
Leu Glu Asn Val Pro Ala Ser Pro Lys Pro Pro Asn Leu Gly Asp Lys

405
Pro Arg Gly Cys Cys Trp Pro Ser
420

410

415

<210> 10
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic construct

<400> 10
Gly Gly Gly Gly Ser
1 5

<210> 11
<211> 2742
<212> DNA
<213> Actinomyces viscosus

<220>
<223> nanH gene for sialidase

<400> 11
atgacatcgc atagtccttt ctcccggagg cgcttgccgg ccctcctggg ctccctgcca 60
ctggccgcca cgggctgat cgccgccgca cccccggcgc acgccgtccc cacgtctgac 120
ggcctggccg acgtcaccat cagcgaggtg aacgcgcccg cggacggcct ctactccgtc 180
ggcgatgtca tgaccttcaa catcaccctg accaacacca gcggcgaggc ccactcctac 240
gccccggcct cgacgaacct gtccgggaac gtctccaagt gccggtggcg caacgtcccg 300
gccgggacga ccaagaccga ctgcaccggc ctggccacgc acacggtgac cgccgaggac 360
ctcaaggccg gtggcttcac ccgcgagatc gcctacgagg tcaaggccgt ggagtacgcc 420
gggaaggccc tgagcacccc ggagacgatc aagggcgcgga cgagcccagt caaggccaac 480
tcgctgcggg tcgagtcgat cagcccgtcg tcgagccagg agaactacaa gctgggcgac 540
accgtcagct acacgggtgcg cgtgcgctcg gtgtcggaca agacgatcaa cgtcgccgcc 600
accgaatcct ccttcgacga cctgggcgcg cagtgccact ggggcggcct caagccgggc 660
aagggcgccg tctacaactg caagccgctc acccacacga tcacgcaagc cgacgtcgac 720
gccggccgct ggacgccatc gatcaccctg acggccaccg gaaccgacgg cgccaccctc 780
cagacgtcga ccgccaccgg caacccgatc aacgtcgtcg gcgaccaccc gcaggccacg 840
ccgcaccggg cgcccgacgc gagcacggag ctgccggcct caatgagcca ggcccagcac 900
ctggccgcca acacggccac cgacaactac cgcattcccg cgataccacc gccccaatg 960
gggacctgct catctcctac gacgagcgcc cgaaggacaa cggcaacggc ggcagcgacg 1020
acccccaaac cgaaccacat cgtccagcgc cgctccaccg acggcgggcaa gacctggtcg 1080
gcgcccacct acatccacca gggcacggag accggcaaga aggtcggcta ctccgacccg 1140
agctacgtcg tcgatcacca gacgggcacg atcttcaact tccacgtcaa gtcttacgac 1200
cagggctggg gcggctcgcg cggcggcacc gacccggaga accggggcat catccaggcc 1260
gaggtgtcga cctccacgga caacggctgg acctggacgc accgcacgat caccgcggac 1320
atcacgaagg acaagccgtg gaccgcgcgt ttcgcggcct cgggccaggg catccagatt 1380
cagcacgggc cccacgccgg gcgcctggtg cagcagtaca cgatcaggac cgccggcggg 1440
ccggtgcagg ccgtctcggt ctactccgac gaccacggga agacgtggca ggccggcacg 1500
ccgatcggga ccggcatgga tgagaacaag gtcgttgagc tctccgacgg ctccctcatg 1560
ctcaactcgc ggcctcggga tggetccggc ttccgcaagg tggcccactc caccgacggt 1620
gggcagacct ggagcgagcc ggtgtccgac aagaacctgc ccgactcggg ggacaacgcc 1680
cagatcatcc gagccttccc gaacgccgcg ccggacgacc cgcgcgccaa ggtgctgctg 1740
ctgagccact caccgaaccc gcggccgtgg tgccgtgacc gcggcaccat ctcgatgtcc 1800

tgcgacgacg ggcctcctg gacgaccagc aaggtcttcc acgagccctt cgtcggatac 1860
 acgacgatcg cgggtgcagtc cgacggcagc atcgggctgc tcagcgagga cgcccacaac 1920
 ggcgccgact acggcggcat ctggtaccgc aacttcacga tgaactggct cggcgagcag 1980
 tgcggccaga agccggcgga gccgagcccg ggccgtcgcc gacggcggca ccctcagcgg 2040
 caccgacgga gaagccggcc ccgtcggccg cgccgagcgc tgagcccacg caggcaccgg 2100
 caccatcctc cgcgcccagag ccgagcgtctg cgcccagagcc gagcaggccc cggcgccgga 2160
 gcccacgacc gctccgagca cggagcccac accggctcct gcgcccagtc cgcacctgag 2220
 cagaccgatg ggccgaccgc tgcgcccgca ccggagacgt cctctgcacc ggccgccgaa 2280
 ccgacgcagg ccccgacggt ggcgccttct gttgagccca cgcaggctcc ggggtgcgcag 2340
 ccgagctcag cacccaagcc gggggcgacg ggtcggggccc cgtcggtggt gaacccgaag 2400
 gcgaccgggg cggcgacgga gcctgggacg ccgtcatcga gcgcgagccc ggcaccgagc 2460
 cggaacgcgg cgccgacgcc gaagccgggc atggagcccg atgagattga tcggccgtct 2520
 gacggcacca tggcgcagcc gaccggtgcg ccagcgcgcc gagtgccgcg ccgacgcagg 2580
 cggcgaaggc cggcagcagg ctgtctcgca cgggaccaac gcgctgctga tcctgggcct 2640
 tgcgggtgtc gcggttgctg gcgggtacct gctgctgcgg gctcgccgtt cgaagaactg 2700
 aacacgcgac gagccggtca tccggctctg agcactgact ga 2742

<210> 12
 <211> 913
 <212> PRT
 <213> Actinomyces viscosus

<220>
 <223> nanH sialidase

<400> 12
 Met Thr Ser His Ser Pro Phe Ser Arg Arg Arg Leu Pro Ala Leu Leu
 1 5 10 15
 Gly Ser Leu Pro Leu Ala Ala Thr Gly Leu Ile Ala Ala Ala Pro Pro
 20 25 30
 Ala His Ala Val Pro Thr Ser Asp Gly Leu Ala Asp Val Thr Ile Thr
 35 40 45
 Gln Val Asn Ala Pro Ala Asp Gly Leu Tyr Ser Val Gly Asp Val Met
 50 55 60
 Thr Phe Asn Ile Thr Leu Thr Asn Thr Ser Gly Glu Ala His Ser Tyr
 65 70 75 80
 Ala Pro Ala Ser Thr Asn Leu Ser Gly Asn Val Ser Lys Cys Arg Trp
 85 90 95
 Arg Asn Val Pro Ala Gly Thr Thr Lys Thr Asp Cys Thr Gly Leu Ala
 100 105 110
 Thr His Thr Val Thr Ala Glu Asp Leu Lys Ala Gly Gly Phe Thr Pro
 115 120 125
 Gln Ile Ala Tyr Glu Val Lys Ala Val Glu Tyr Ala Gly Lys Ala Leu
 130 135 140
 Ser Thr Pro Glu Thr Ile Lys Gly Ala Thr Ser Pro Val Lys Ala Asn
 145 150 155 160
 Ser Leu Arg Val Glu Ser Ile Thr Pro Ser Ser Ser Gln Glu Asn Tyr
 165 170 175
 Lys Leu Gly Asp Thr Val Ser Tyr Thr Val Arg Val Arg Ser Val Ser
 180 185 190
 Asp Lys Thr Ile Asn Val Ala Ala Thr Glu Ser Ser Phe Asp Asp Leu
 195 200 205
 Gly Arg Gln Cys His Trp Gly Gly Leu Lys Pro Gly Lys Gly Ala Val
 210 215 220
 Tyr Asn Cys Lys Pro Leu Thr His Thr Ile Thr Gln Ala Asp Val Asp
 225 230 235 240
 Ala Gly Arg Trp Thr Pro Ser Ile Thr Leu Thr Ala Thr Gly Thr Asp

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | | 245 | | | | | 250 | | | | | 255 | | | |
| Gly | Ala | Thr | Leu | Gln | Thr | Leu | Thr | Ala | Thr | Gly | Asn | Pro | Ile | Asn | Val | | |
| | | | | 260 | | | | | 265 | | | | | 270 | | | |
| Val | Gly | Asp | His | Pro | Gln | Ala | Thr | Pro | Ala | Pro | Ala | Pro | Asp | Ala | Ser | | |
| | | | | 275 | | | | | 280 | | | | | 285 | | | |
| Thr | Glu | Leu | Pro | Ala | Ser | Met | Ser | Gln | Ala | Gln | His | Leu | Ala | Ala | Asn | | |
| | | | | 290 | | | | | 295 | | | | | 300 | | | |
| Thr | Ala | Thr | Asp | Asn | Tyr | Arg | Ile | Pro | Ala | Ile | Pro | Pro | Pro | Pro | Met | | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | | |
| Gly | Thr | Cys | Ser | Ser | Pro | Thr | Thr | Ser | Ala | Arg | Arg | Thr | Thr | Ala | Thr | | |
| | | | | 325 | | | | | 330 | | | | | 335 | | | |
| Ala | Ala | Ala | Thr | Thr | Pro | Asn | Pro | Asn | His | Ile | Val | Gln | Arg | Arg | Ser | | |
| | | | | 340 | | | | | 345 | | | | | 350 | | | |
| Thr | Asp | Gly | Gly | Lys | Thr | Trp | Ser | Ala | Pro | Thr | Tyr | Ile | His | Gln | Gly | | |
| | | | | 355 | | | | | 360 | | | | | 365 | | | |
| Thr | Glu | Thr | Gly | Lys | Lys | Val | Gly | Tyr | Ser | Asp | Pro | Ser | Tyr | Val | Val | | |
| | | | | 370 | | | | | 375 | | | | | 380 | | | |
| Asp | His | Gln | Thr | Gly | Thr | Ile | Phe | Asn | Phe | His | Val | Lys | Ser | Tyr | Asp | | |
| 385 | | | | | | 390 | | | | 395 | | | | | 400 | | |
| Gln | Gly | Trp | Gly | Gly | Ser | Arg | Gly | Gly | Thr | Asp | Pro | Glu | Asn | Arg | Gly | | |
| | | | | 405 | | | | | 410 | | | | | 415 | | | |
| Ile | Ile | Gln | Ala | Glu | Val | Ser | Thr | Ser | Thr | Asp | Asn | Gly | Trp | Thr | Trp | | |
| | | | | 420 | | | | | 425 | | | | | 430 | | | |
| Thr | His | Arg | Thr | Ile | Thr | Ala | Asp | Ile | Thr | Lys | Asp | Lys | Pro | Trp | Thr | | |
| | | | | 435 | | | | | 440 | | | | | 445 | | | |
| Ala | Arg | Phe | Ala | Ala | Ser | Gly | Gln | Gly | Ile | Gln | Ile | Gln | His | Gly | Pro | | |
| | | | | 450 | | | | | 455 | | | | | 460 | | | |
| His | Ala | Gly | Arg | Leu | Val | Gln | Gln | Tyr | Thr | Ile | Arg | Thr | Ala | Gly | Gly | | |
| 465 | | | | | | 470 | | | | 475 | | | | | 480 | | |
| Pro | Val | Gln | Ala | Val | Ser | Val | Tyr | Ser | Asp | Asp | His | Gly | Lys | Thr | Trp | | |
| | | | | 485 | | | | | 490 | | | | | 495 | | | |
| Gln | Ala | Gly | Thr | Pro | Ile | Gly | Thr | Gly | Met | Asp | Glu | Asn | Lys | Val | Val | | |
| | | | | 500 | | | | | 505 | | | | | 510 | | | |
| Glu | Leu | Ser | Asp | Gly | Ser | Leu | Met | Leu | Asn | Ser | Arg | Ala | Ser | Asp | Gly | | |
| | | | | 515 | | | | | 520 | | | | | 525 | | | |
| Ser | Gly | Phe | Arg | Lys | Val | Ala | His | Ser | Thr | Asp | Gly | Gly | Gln | Thr | Trp | | |
| | | | | 530 | | | | | 535 | | | | | 540 | | | |
| Ser | Glu | Pro | Val | Ser | Asp | Lys | Asn | Leu | Pro | Asp | Ser | Val | Asp | Asn | Ala | | |
| 545 | | | | | | 550 | | | | 555 | | | | | 560 | | |
| Gln | Ile | Ile | Arg | Ala | Phe | Pro | Asn | Ala | Ala | Pro | Asp | Asp | Pro | Arg | Ala | | |
| | | | | 565 | | | | | 570 | | | | | 575 | | | |
| Lys | Val | Leu | Leu | Leu | Ser | His | Ser | Pro | Asn | Pro | Arg | Pro | Trp | Cys | Arg | | |
| | | | | 580 | | | | | 585 | | | | | 590 | | | |